Miscellaneous Report No. 36

# THE MORE IMPORTANT FOREST INSECTS IN THE LAKE STATES IN 1954

by

L. C. Beckwith and H. J. MacAloney, Entomologists

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Lake States Forest Experiment Station

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Lake States Forest Experiment Station[1/]

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The importance of wood and its products in the economy of the United States makes the protection of our forests and forest land of paramount significance, if we are to maintain our present standard of living. Although usually not so spectacular as fire, the annual losses due to attacks by insects and diseases are much greater.

This report, covering the more important forest insects in the Lake States in 1954, has been made possible through survey information provided by the following cooperating agencies:

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| Wisconsin: | Office of the State Entomologist<br>Conservation Department<br>University of Wisconsin |
| Minnesota: | Office of the State Entomologist<br>Department of Conservation<br>University of Minnesota |
| Michigan: | Department of Conservation<br>Department of Agriculture<br>University of Michigan<br>Michigan State College<br>Kimberly-Clark of Michigan Inc. |
| U. S. Government: | Office of Indian Affairs, USDI<br>Forest Service, USDA |

Following the procedure used in previous reports the more important species are discussed in some detail, while those of less importance are mentioned briefly.

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1/ Maintained by the U. S. Department of Agriculture, Forest Service, in cooperation with the University of Minnesota, St. Paul 1, Minnesota.

Spruce Budworm (Choristoneura fumiferana (Clem.))

The spruce budworm is one of the most destructive insects to be found in the spruce-fir types of this country. In the past, it has caused tremendous damage in the Northeast, Northwest, and also in Canada. The discovery of this insect in the Lake States in 1954 was probably the most important item of entomological record in the region. A heavy infestation, of several years' standing and covering approximately 2,500 acres, was found in the Keweenaw Peninsula in northern Michigan by R. J. Griewe, District Forester for Kimberly-Clark of Michigan, Inc. (see accompanying map). Merchantable balsam fir was almost completely defoliated, and the black spruce beneath was heavily fed upon. Much of the balsam fir in this area is overmature and is being cut for pulpwood. A recommendation was made that the cutting operation be speeded up so as to remove all the spruce and balsam fir within 2 years. For this reason, no chemical control measures are planned at the present time. This insect has now been added to the Pest Detection Program critical insect list for the Upper Peninsula in 1955.

In Minnesota, light populations of large vigorous caterpillars were found at 51 points throughout the spruce-fir types on the Superior National Forest and in one location on the Chippewa National Forest, near Dora Lake in Itasca County. In one area in the western part of Shawano County, Wisconsin, cast pupal skins and eggs were found on balsam fir. It is reasonable to assume that the insect is present in the fir stands between this point and the infestation in the Keweenaw Peninsula,

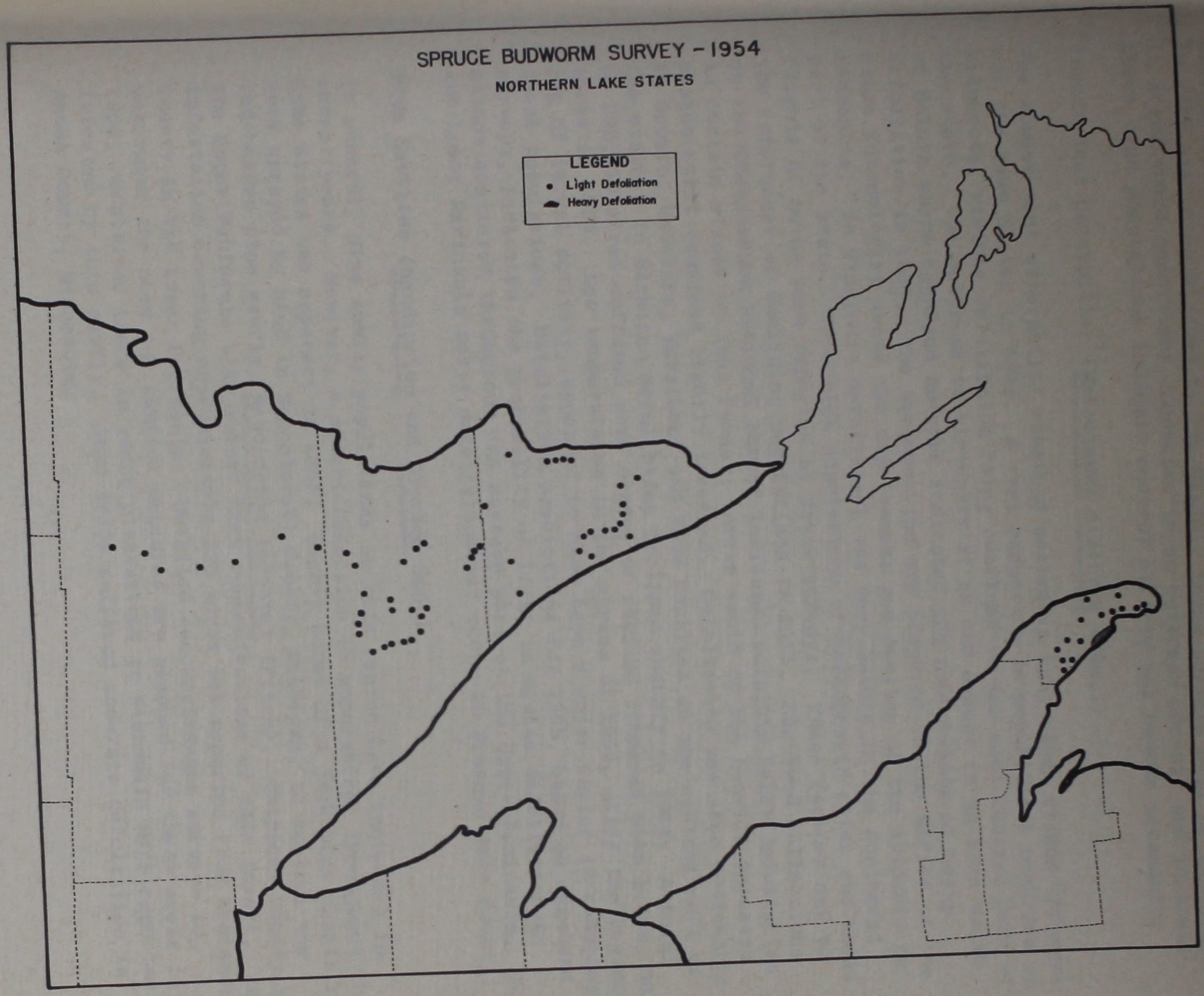
Jack-Pine Budworm (Choristoneura pinus Free.)

Although not as damaging as the spruce budworm is in the spruce-fir type, the jack-pine budworm has been an important insect pest of jack pine in the Lake States region for the past 30 years. The populations in lower Michigan declined to a low level except in Lake and Grand Traverse Counties, where defoliation intensity increased. The outbreak on the Lake Superior State Forest, in Luce County in the Upper Peninsula, has not increased in total area, but the area of heaviest defoliation has moved eastward. Feeding was reported for the first time in Marquette County. The infestation on the Raco Ranger District of the Upper Michigan National Forest did not increase in intensity. Approximately 8,900 acres of jack pine stands in Marinette County in Wisconsin were defoliated. The acreage of infestation in Washburn and Douglas Counties, northwestern Wisconsin, increased; 20,000 acres of heavily infested pole and mature jack pine being reported by the Conservation Department. This included a large acreage on Mosinee Paper Company lands in Douglas County. In this same general area, stands on the Chequamegon National Forest showed noticeable feeding but the acreage affected is not known.

In an area northwest of Bemidji, Minnesota, heavy damage occurred in mature jack pine stands covering nearly 5,000 acres. All told, feeding damage was found in six different areas located in Crow Wing, Cass, Wadena, Hubbard and Beltrami Counties. These infestations each covered

# SPRUCE BUDWORM SURVEY - 1954

## NORTHERN LAKE STATES




USDA-SCS-MILWAUKEE, WIS. 1954

an estimated 1 to 5 square miles of the jack pine type. No mortality is expected as a result of this one year's defoliation; however, the susceptible type of jack pine predominates in some areas and should be closely watched in the future for population build-up. Extensive surveys in 1955 are being planned by the State. These surveys will be intensified in areas where conditions conducive to an outbreak prevail and in areas where high populations indicate control efforts may become necessary.

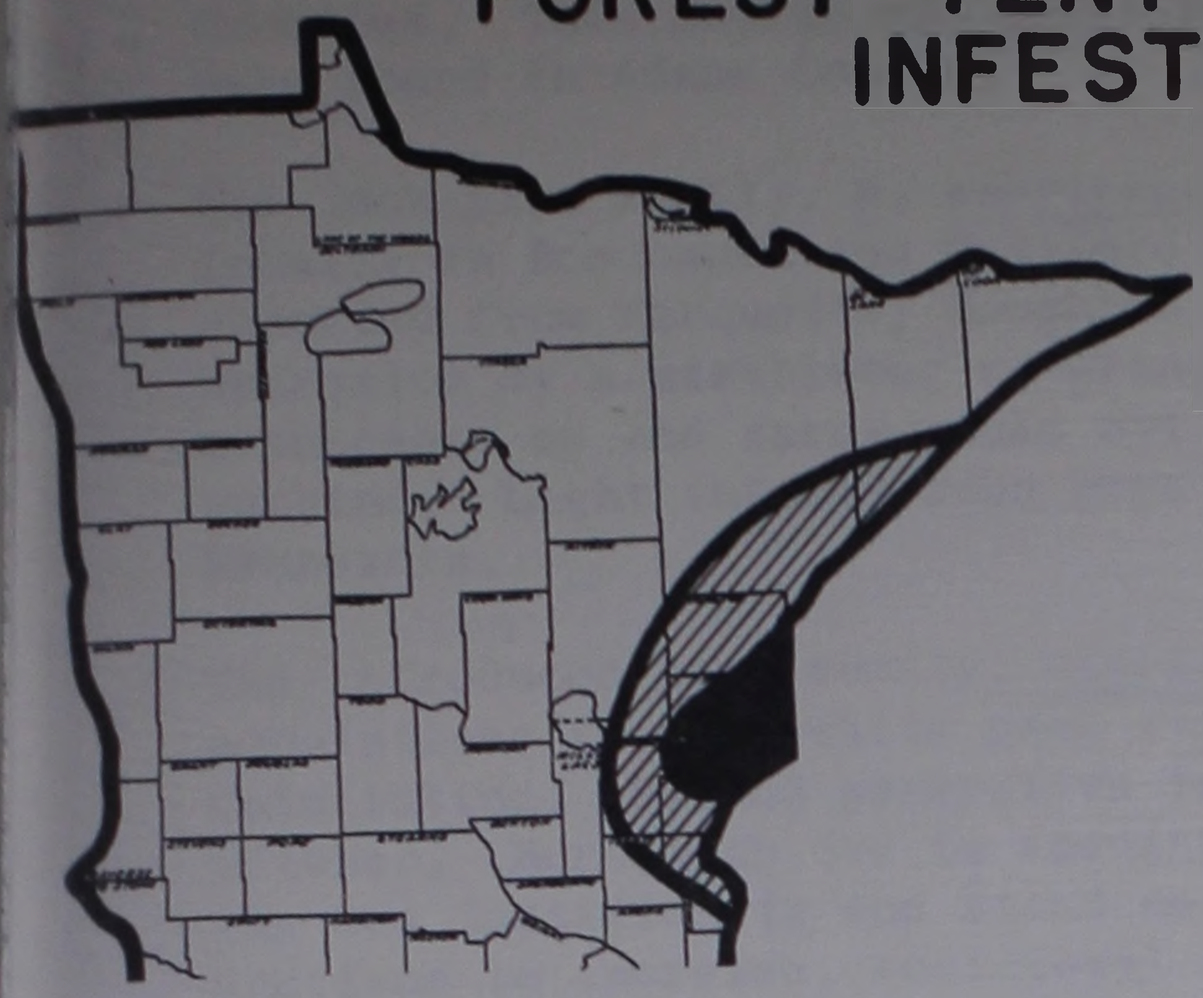
Forest Tent Caterpillar (Malacosoma disstria (Hbn.))

The forest tent caterpillar remained active in many aspen stands throughout the Lake States in 1954. A vast reduction in populations occurred in Minnesota, visible defoliation being confined to the east central part of the state. The outbreak is virtually at an end except in an area south of Duluth where egg-band surveys indicated the probability of heavy defoliation in 1955. The accompanying map prepared in the Office of the State Entomologist shows the development and decline of the epidemic in Minnesota. In Wisconsin defoliation was very severe in the northwest part of the state. Very high populations of Sarcophagid flies and small flights of moths were reported by State surveys. These factors may be the forerunner of declining populations in 1955. Egg-band collections on the Chequamegon National Forest indicated possible heavy defoliation in certain stands on that Forest. Areas south of the heavily infested stands still remained lightly infested. Defoliation was also noticeable in Oconto, Waushara, Marathon, and Wood Counties in the central part of the state. In Michigan defoliation declined sharply in 1954. A total of 292,770 acres suffered some degree of feeding compared with 1,468,000 acres in 1953. Low temperatures in the spring of 1954, after the beginning of larval activity, appeared to have been a major factor in reducing these populations. Defoliation predictions for 1955, based on egg-band surveys, indicated the probability of light to medium defoliation in stands scattered throughout the eastern part of the Upper Peninsula. In the Lower Peninsula heavy defoliation may occur in Presque Isle County.

Pine Sawflies (Neodiprion and Diprion Spp.)

In general, pine sawfly populations in this region have increased in recent years. However, a slight reduction in populations throughout the Lake States was apparent in 1954. Eighty acres of a jack pine plantation were sprayed by hand in Schoolcraft County, Michigan, to control the red-headed pine sawfly, Neodiprion lecontei (Fitch). Chippewa County in the Upper Peninsula also showed high concentrations of this insect. An infestation covering approximately 220 acres was reported from Leelanau County in the Lower Peninsula. Detailed reconnaissance surveys to determine the need for control measures are planned for these areas in 1955. Scattered trees in young plantations in Wisconsin were reported infested by this sawfly. Some trees suffered moderate defoliation in Anoka County, Minnesota.

# MINNESOTA
# FOREST TENT CATERPILLAR INFESTATION



## 1955
## DEFOLIATION (PREDICTED)

HEAVY

LIGHT TO MODERATE

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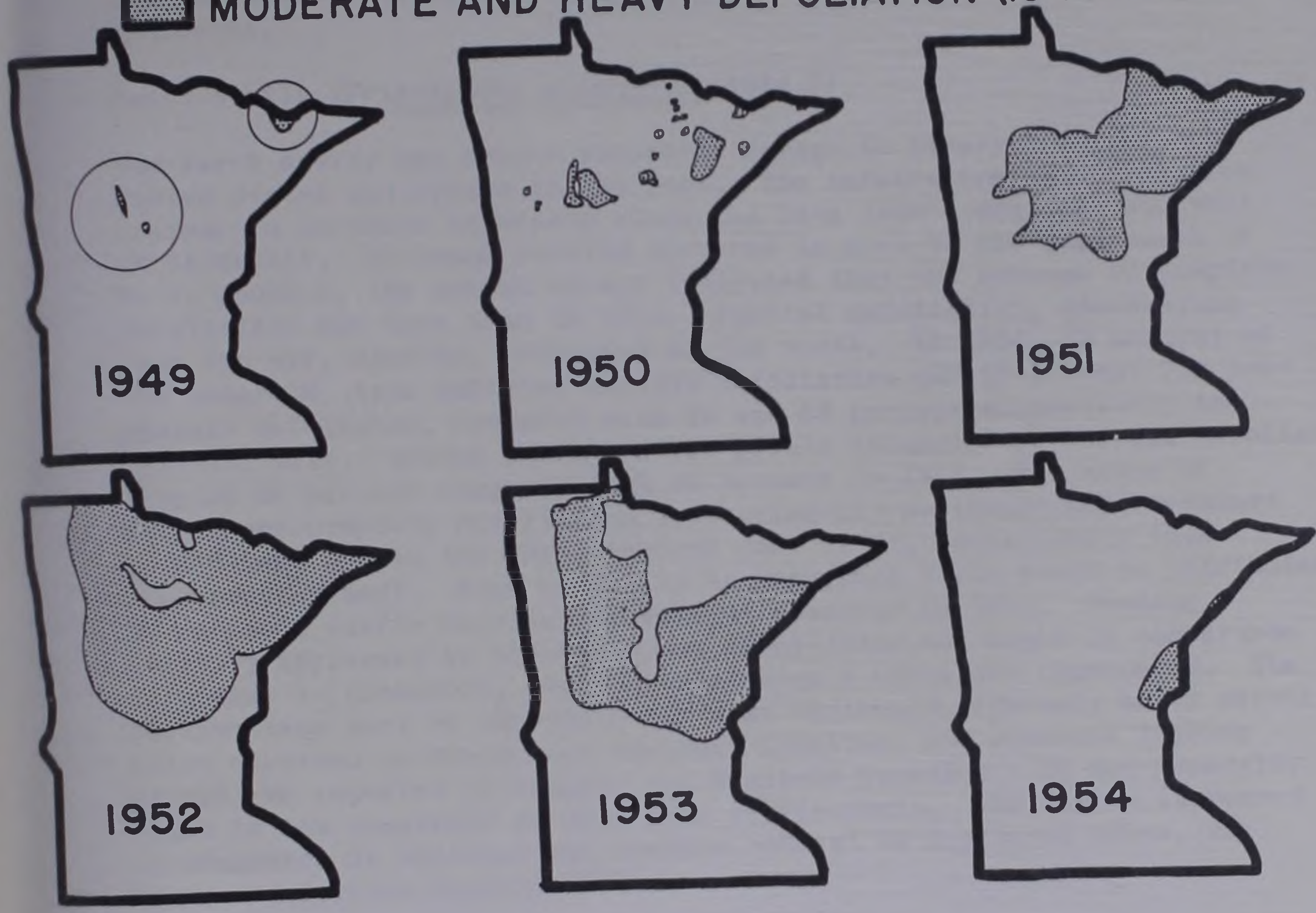
MODERATE AND HEAVY DEFOLIATION (1949-1954)




USDA SCS MILWAUKEE WIS 1960

The European pine sawfly, N. sertifer (Geoff.), caused slightly less injury in Michigan than it did in 1953. Nevertheless, populations remained rather high in susceptible stands, especially in Oakland and Washtenaw Counties. This sawfly was first reported in Wisconsin in 1954; 8 larvae were found in Adams County.

The jack pine sawfly, N. americanus banksianae Roh., was abundant locally in Roscommon and Crawford Counties of Michigan. It was also reported from Marquette, Houghton and Gladwin Counties. A spraying operation by a mistblower covering 20 acres in Roscommon County was not a success, as the spray could not be forced into the tree tops by this machine. Light infestations were found in Hubbard and Cook Counties in Minnesota.

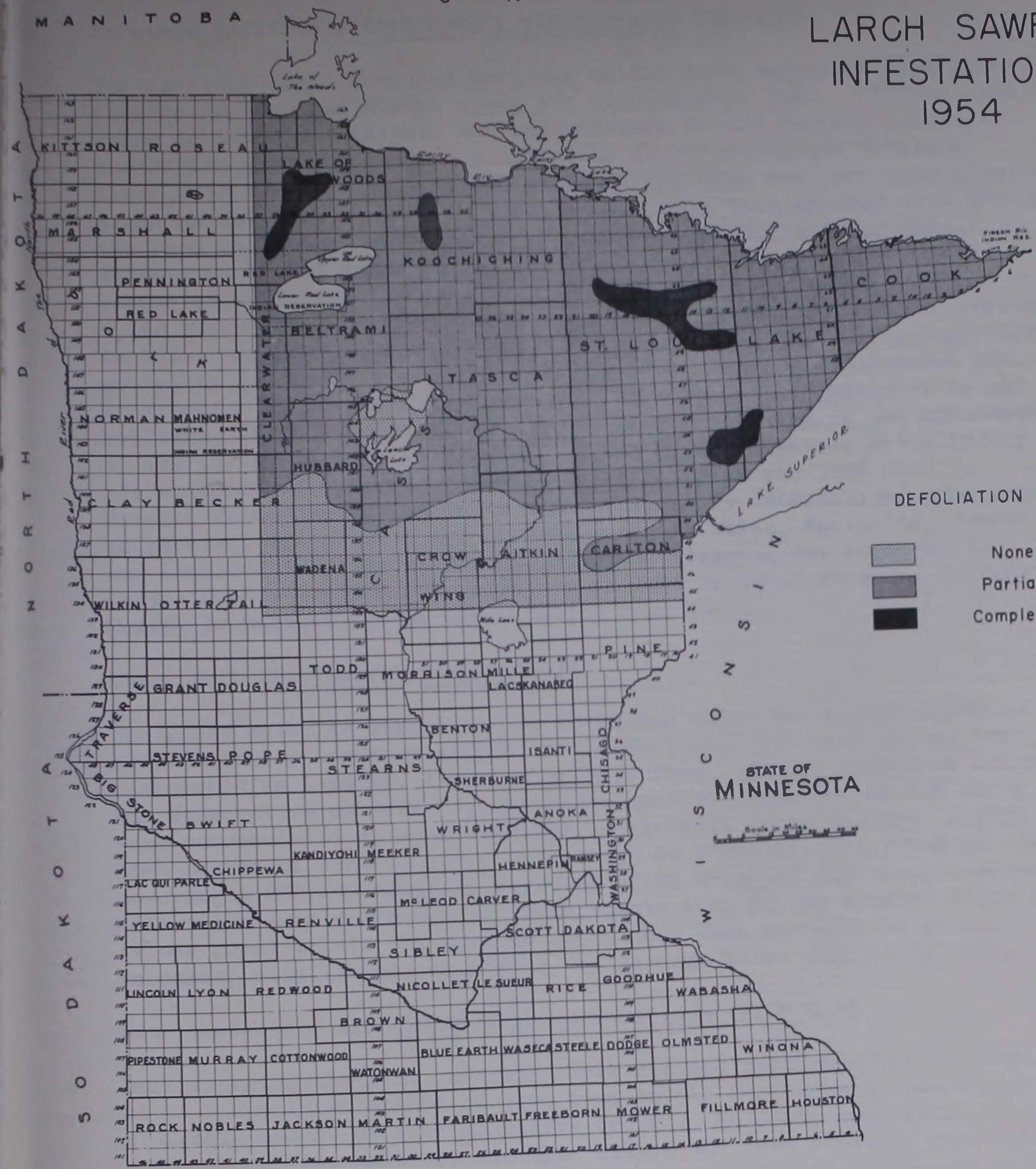
The introduced pine sawfly, Diprion similis (Htg.), increased in populations in many white pine stands in Minnesota, causing noticeable defoliation. Second generation larvae continued to feed until late in October. Mortality due to feeding was not noticed, but control by spraying was justified in one stand near St. Cloud. If the populations continue to increase, additional control work may be necessary in 1955 to protect valuable white pine stands.

In addition to the above, the red pine sawfly, Neodiprion nanulus Schedl., and the white pine sawfly, N. pinetum (Norton), were reported from Minnesota.

Larch Sawfly (Pristiphora erichsonii (Htg.))

The larch sawfly has caused extensive damage to tamarack in the United States and Canada in the past. The infestation which has been present in northern Minnesota since the late 1940's declined somewhat in intensity. Although feeding occurred in most of the area north of U. S. Route 2, the aerial survey indicated that the acreage of complete defoliation was less than in 1953. Partial defoliation, discernible from the air, however, increased to the south. In 1954, 73 percent of the tamarack type suffered partial defoliation and 16 percent was completely defoliated, compared with 26 and 56 percent respectively the previous year. Ground surveys at 24 points indicated an average defoliation of 61 percent compared with 84 percent in 1953. The areas of contiguous complete defoliation were primarily northwest and northeast of Red Lake and in the north central part of St. Louis County (see accompanying map). Tree mortality in Minnesota which could be attributed to repeated sawfly defoliation was not observed in 1954. Feeding activity increased in Wisconsin but defoliation was light in comparison with that in Minnesota, when the states as a whole are considered. The northwestern part of Wisconsin was most seriously affected; heavy defoliation occurred in Sawyer and Washburn Counties, and moderate feeding damage was reported in Douglas and Bayfield Counties. It was generally light in the remainder of this part of Wisconsin. The sawfly increased in abundance in Michigan but nowhere, except on scattered trees, was heavy defoliation encountered.

# LARCH SAWFLY INFESTATION 1954



Although attacks by the eastern larch beetle, Dendroctonus simplex Lec., have been observed following cutting or drainage interruption due to road construction, examinations of trees in the established ground survey points in Minnesota during 1954 showed no evidence of bark beetle attack.

Saratoga Spittlebug (Aphrophora saratogensis (Fitch))

The Saratoga spittlebug has been one of the most important plantation insects in the Lake States since its discovery in 1941. Although its range includes the eastern and southeastern United States, excessive damage has occurred only in plantations in Wisconsin and Michigan. Since 1945 approximately 46,600 acres of red pine and jack pine plantations on national forests in these states have been sprayed with DDT at the rate of 1 pound in 1 gallon of solvent and fuel oil per acre. Surveys on 36,600 acres on the national forests in the fall of 1954 indicated sufficiently heavy feeding on 7,512 acres in the open and on 4,260 acres under hardwood cover to warrant recommendations for treatment in 1955. As has happened in previous years winter and spring spittlebug mortality may cause a reduction in the total acreage recommended for treatment. In northern Michigan, on lands other than national forest holdings, there were indications of a slight increase in the abundance of the insect in some localities; in the Lower Peninsula heavy injury was encountered only in a plantation of red pine and jack pine in Presque Isle County. Light to moderately heavy infestations were reported in plantations on state and private lands in Vilas, Marinette, Sawyer and Langlade Counties in Wisconsin. Some flagging was reported in Sawyer County. A control operation in 1955 on about 80 acres in Langlade County is planned by the Conservation Department.

Gypsy Moth (Porthetria dispar (L.))

The gypsy moth, an insect native to Europe which has caused heavy defoliation of hardwood stands in the Northeast for many years, was discovered in Lansing, Michigan in May, 1954. By the immediate action and cooperation of federal, state, and private agencies 88,640 acres were successfully sprayed with DDT by aircraft early in June, a very high degree of control being obtained. As a result of a trapping program, covering 1,860,000 acres in a radius of 25 miles of the treated areas, male moths were collected at three points west of the sprayed areas and at one point within the sprayed area. Egg mass surveys, in progress in December, will largely determine the acreage to be treated in 1955.

Pine Tortoise Scale (Toumeyella numismaticum (P. & M.))

Periodically, the pine tortoise scale becomes very abundant in plantations and natural stands of jack pine in the Lake States, and a considerable amount of tree mortality occurs. Epidemic conditions rose suddenly in Wisconsin and Michigan within the past 2 years, and almost complete mortality on about 4,000 acres resulted. In Wisconsin, a large acreage of plantations in Marinette County, was treated by the State in

cooperation with the University of Wisconsin with a Malathion-DDT spray mixture applied by airplane. Population counts before and after spraying indicated a high degree of scale mortality. However, natural control factors, chiefly ladybird beetles, exerted such a high degree of control in the check areas that an evaluation of the insecticidal control was impossible. On two small areas on the Nicolet National Forest which were also sprayed to control this pest, a similar difficulty was encountered in evaluating the treatment because of natural control factors. In certain areas, the coccinellid population was very high. Surveys in October indicated a substantial reduction in populations in other infested plantations on the Nicolet National Forest. Heavy infestations on small acreages of natural stands were reported in Douglas and Sawyer Counties. A light infestation covering 1,100 acres occurred in the Conover area of Vilas County.

State surveys in Michigan revealed a severe infestation in Schoolcraft County in the Upper Peninsula, where more than 75 percent of the jack pines in all size classes in an area covering more than three square miles were killed. More than 1,000 acres on the Rapid River Ranger District of the Upper Michigan National Forest suffered injury. The natural factors so prevalent in Wisconsin in 1954, did not appear to exert an appreciable controlling effect in the Michigan infestations.

This scale insect was scattered throughout the jack pine areas in Minnesota. Locally, populations were moderate to heavy in Itasca, St. Louis, Carlton, Crow Wing and Sherburne Counties. Some mortality of young pines occurred near Hibbing, Minnesota.

Walkingstick (Diapheromera femorata (Say))

Heavy feeding by the even-year brood of the walkingstick occurred in oak stands in Marinette County in northeastern Wisconsin and in Eau Claire County in the western part of the state. An egg survey in odd-year infestation on the Menominee Indian Reservation, Wisconsin, was made in October, 1954. Examination of the duff samples indicated an egg population of more than 20 per square foot which is considered sufficient to predict heavy defoliation. Consequently, aerial insecticidal control operations have been recommended in two stands of high value oak type, covering about 1,200 acres. Defoliation was noticeable in a number of localities in Michigan. After feeding was completed ground surveys in Dickinson County in the Upper Peninsula and aerial surveys in the Lower Peninsula indicated that a total of 26,470 acres suffered defoliation, an increase of 1,500 acres over that reported in 1952. The largest contiguous area occurred in Ogemaw County in the Lower Peninsula where 23,040 acres were defoliated. A few specimens were collected near Morton, Minnesota, but no noticeable defoliation was reported; this is the "off-year" in Minnesota, but during the odd years this insect often becomes one of the more important defoliators.

European Pine Shoot Moth (Rhyacionia buoliana (Schiff.))

In this region, populations of the European pine shoot moth have increased in many areas in the past few years until they have reached serious proportions. Medium to heavy infestations were reported in Manitowoc and Sheboygan Counties in Wisconsin. Heaviest infestations were encountered in red pine and Scotch pine plantations in the southern part of the Lower Peninsula of Michigan. The infestation increased in severity in a plantation near Harrietta, Wexford County, where studies on cold temperature tolerance have been under way since 1952. Infestations were discovered in additional plantations in this same general area. A small control project is planned on approximately 20 acres within a 90-acre red pine plantation, a few miles southwest of Harrietta. Treatment will consist of cutting and burning the most seriously infested trees to prevent heavy infestation from building up in the remainder of the plantation. Many of the Land Utilization plantations in Ottawa County have been heavily infested for several years. Mild winter temperatures in this area are conducive to population increase. Approximately 45,000 acres of privately-owned plantations, many of them infested, are near these plantations. An infestation of a roadside planting in Houghton County in the Upper Peninsula was detected and removal and destruction of the infested trees was recommended.

White-Pine Weevil (Pissodes strobi (Peck))

The white-pine weevil is one of the most important pests of immature pine stands, natural as well as planted. This insect was reported well distributed on a variety of pine hosts throughout the Lake States. In local areas of Chippewa, Lake, and Allegan Counties of Michigan, over 60 percent of the terminals of jack pine and white pine were damaged. Austrian pine and Scotch pine in Land Utilization plantations in the vicinity of Muskegon, showed a high incidence of attack, apparently being more favored hosts than white pine in the same plantations. The weevil is an important pest in Christmas tree plantings in Michigan, attacking Norway spruce and Douglas-fir as well as the pines. In Wisconsin, heavy damage to white and jack pine occurred in Douglas, Langlade, Vilas, Sawyer, Dunn and Rusk Counties. Weeviling of white pine was scattered, although generally light, throughout the northern half of Minnesota.

Yellow-Headed Spruce Sawfly (Pikonema alaskensis (Roh.))

This sawfly was abundant in many of the spruce-fir stands throughout northern Minnesota; it was also found on white spruce at Cass Lake. A moderate infestation was found in a white spruce windbreak in Sheboygan County, Wisconsin, and on Norway spruce in the Keweenaw Peninsula in Upper Michigan.

Variable Oak Leaf Caterpillar (Heterocampa manteo (Dbldy.))

Periodically, this insect becomes abundant in this region and strips the leaves from hardwood trees. During August and September of 1954, high populations developed on basswood, birch, elm, and oak covering a relatively large section of Minnesota, beginning south of St. Cloud and extending 150 miles in a northwest direction. Light defoliation existed in most of this area; but moderate to heavy defoliation was found in 25 localized areas. Because the defoliation occurred late in the season, serious damage was not apparent.

Birch Leaf Skeletonizer (Bucculatrix canadensisella Cham.)

For the second year a general epidemic of this leaf-feeding insect occurred throughout the northern part of the Lake States. Defoliation was general, primarily on paper birch but to some extent on yellow, but as it occurred so late in the season, tree decadence was not evident. Several successive years of defoliation may produce increment loss and predispose the trees to attack by other insects and diseases.

Pitch Midge (Retinodiplosis resinicola (O.S.))

Approximately 3,000 acres of jack pine on the Rapid River Ranger District of the Upper Michigan National Forest were heavily infested by this insect. A combination of poor soil conditions and attacks by this midge, the pine tortoise scale, the pitch nodule maker, and an undetermined tip moth, has resulted in poor tree form over much of the total acreage with a definite reduction in increment and height growth and, in some cases, death of twigs, branches, and entire trees.

Smaller European Elm Bark Beetle (Scolytus multistriatus (Marsh.))

This insect, a vector of the Dutch elm disease, is becoming more common in many parts of the Lake States; it was very abundant in several localities in southern Wisconsin. Special surveys were carried out to determine the local incidence of attack, particularly in the cities of Milwaukee, Kenosha, Lake Geneva, and Beloit. The insect was also collected in Fond du Lac and Douglas Counties.

Pine Chafer or Anomala Beetle (Anomala oblivia Horn)

Feeding injury was more severe in Lower Michigan in 1954 than in recent years. Many jack pine stands in the northern part of Montmorency County were extremely hard hit with 100 percent defoliation of the current season's foliage resulting in many cases. State reports show that north of a line from Bay City to Muskegon heavy larval populations were found on the roots of various pines in Christmas tree plantations. The insect has not been found in the Upper Peninsula.

Pine Spittlebug (Aphrophora parallela (Say))

Medium to heavy infestations were found on Scotch pine in Waushara County, and the insect was abundant in Adams and Wood Counties, Wisconsin. This insect was reported in large numbers in Baraga County, Michigan, and it also was found scattered throughout the northern part of Minnesota.

Larch Casebearer (Coleophora laricella (Hbn.))

Although the larch casebearer was again reported from numerous localities in the Lake States, populations declined over those observed in previous years. In Michigan, many areas that harbored the insect in 1953 were reported negative in 1954. Heaviest injury was found locally in Marquette, Delta, and Chippewa Counties in the Upper Peninsula. Defoliation was heavy in the northeast and central portions of Wisconsin. The insect was very lightly distributed in Minnesota.

Birch Dieback (cause unknown)

An apparent "dieback" condition exists in yellow birch stands in hardwood types in Upper Michigan. Ten to 80 percent of the crowns of many of the trees in the Ironwood-Wakefield area were dead in September, 1954. This condition was apparent in young as well as overmature trees. Examinations of affected trees produced no evidence that insects were primarily involved in the decadence.